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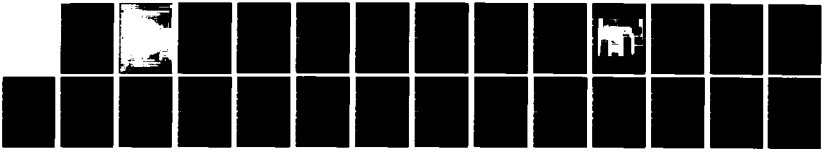

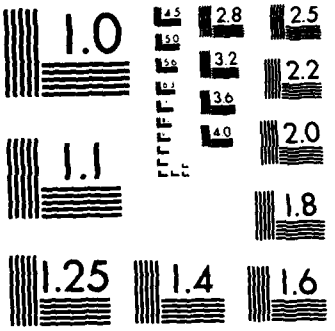

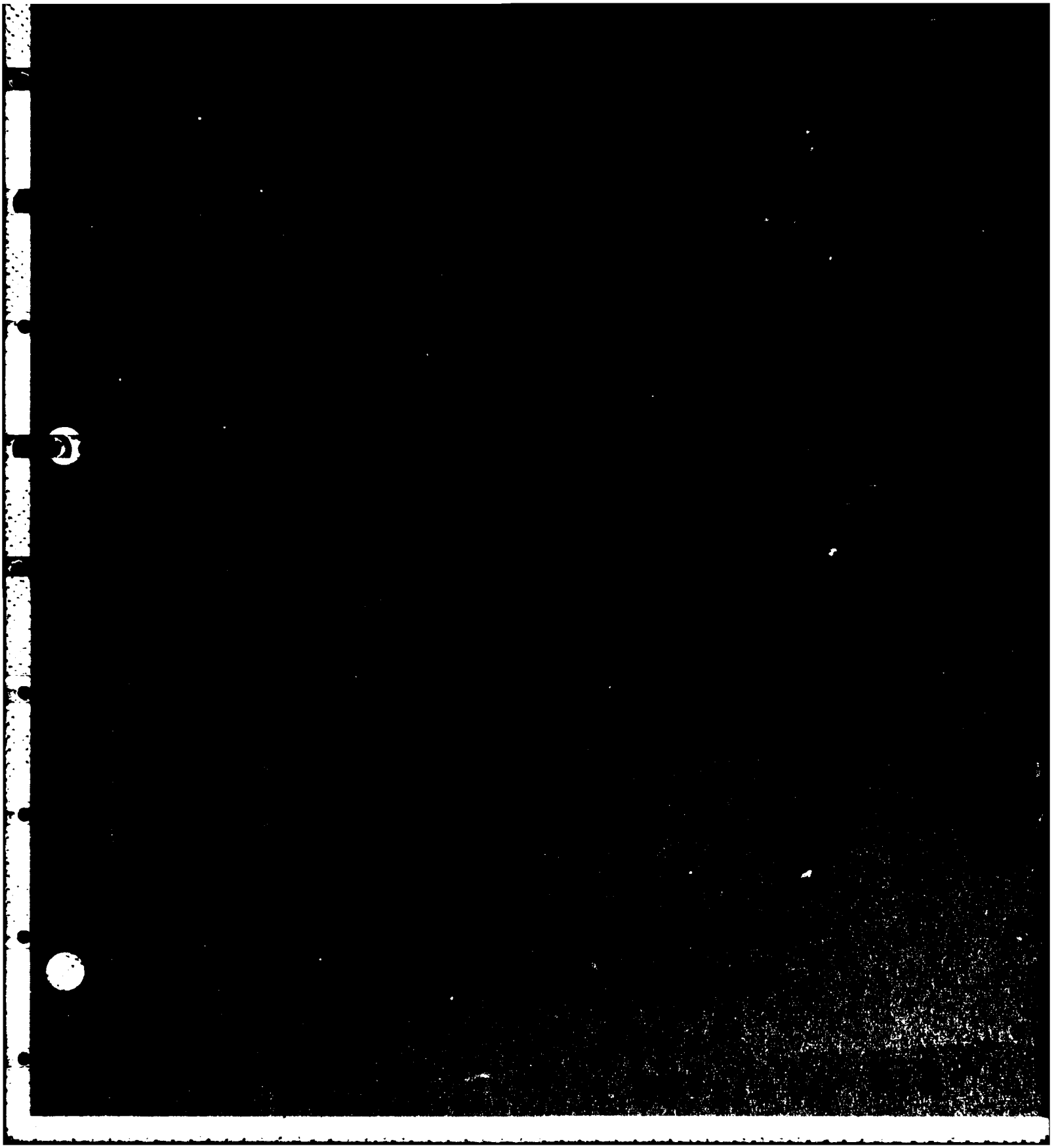

Editorial Review by Major Hogge and Captain Ellerbe
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This research report is presented as a competent treatment of the subject, worthy of publication. The United States Air Force Academy vouches for the quality of the research, without necessarily endorsing the opinions and conclusions of the author.

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This technical report outlines the use of poster sessions to convey student and faculty research results. It reviews the method of communicating through professional-quality posters and the current application of this method in the scientific community. Further, it presents our experiences in applying this method at the undergraduate level and gives instructions for employing the poster format.

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POSTER PRESENTATIONS IN UNDERGRADUATE EDUCATION AND AT PROFESSIONAL MEETINGS

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OCTOBER 1983

DEAN OF THE FACULTY

UNITED STATES AIR FORCE ACADEMY

TABLE OF CONTENTS

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We sincerely thank Major Robert M. Hogge and Captain John C. Ellerbe, III of the Department of English for a critical review and many helpful suggestions which substantially improved this report.

INTRODUCTION

To be effective, methods of technical communication must be adapted to a variety of situations. (3,4,5,8,10) One relatively new method is the poster presentation. Probably a derivative of earlier, more simplistic displays at science fairs in our secondary schools, poster sessions were initially viewed warily by the professional community. Now, however, they have developed into a widely-accepted and valuable form of technical communication.

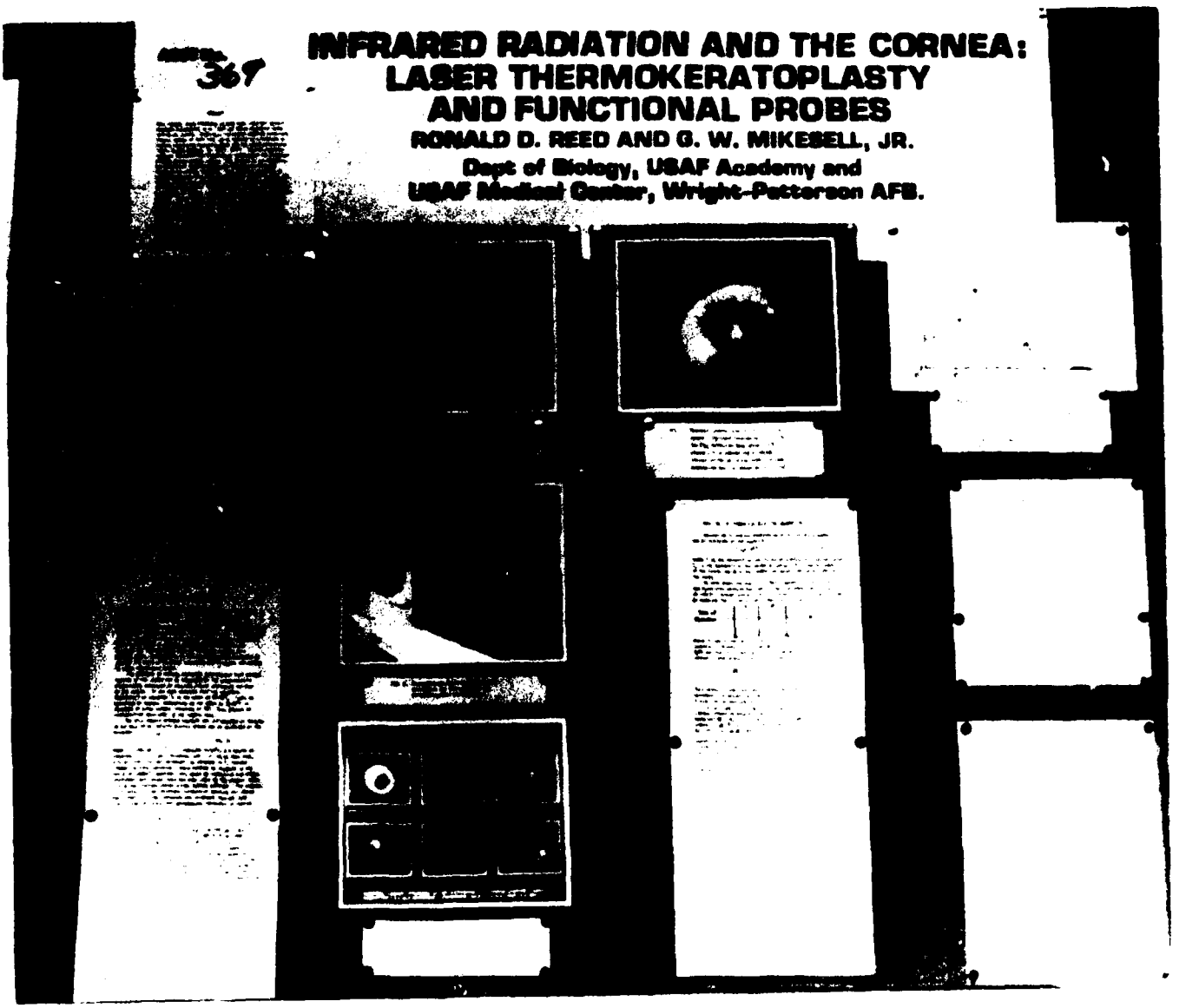
Of course, formal report or lecture formats continue to be useful if the speaker can effectively relay information to the audience and if that audience has a relatively similar background. But potential audiences vary considerably in understanding of the subject material. Thus, a speaker usually addresses a "target" audience composed of those who have a similar background and yet are not already aware of this new information. Consequently, those in the audience at a higher or lower level of understanding are often either bored or confused. Poster presentations, of course, can't prevent boredom and confusion. But they are particularly effective when the audience is of a varied background or when the speaker wants to establish individual, in-depth communication with the most interested members of the audience.

The purpose of this report is to review the use of poster presentations at the United States Air Force Academy (USAFA) and at professional meetings. We have included information for poster authors and guidance for planning a poster session.

THE POSTER FORMAT

Most poster presentations have formats (such as shown in Figure 1, Appendix 2 or Appendix 3) which are useful for presenting results of scientific experiments. But modified poster formats can also be applied to almost any specialized area. Some formats rely less on figures and tables and more on photographs, (Appendix 3), or more on a problem solving format, (Appendix 4). The dimensions shown for the poster board surface area in Appendix 2 (5'6" by 3'8") are used by many American scientific associations, institutes, and societies; the near-universal acceptance of this set of dimensions has made it the de facto standard. After reviewing handouts on poster presentations available at scientific meetings (2,6,9), we have compiled the instructions and helpful hints for poster authors in Appendix 1.

Figure 1: Poster Derived from a Presentation to the American Physiological Society



CURRENT USE OF POSTERS AT MEETINGS

At scientific meetings, posters are usually placed in a specially reserved area. Those attending the meeting receive a schedule listing titles, abstracts, and locations of each poster. Standing by each poster, authors are available for scheduled periods of time. During the poster session, members of the audience review the schedule and then look for those posters which are of personal or professional interest. They can review each poster in a few minutes and, if they have questions, seek further information when the author is available.

A variation of this type of session is the poster-panel. Here, posters are on display for a set period of time (usually 1-2 hours), while members of the conference review the posters to achieve a fairly uniform understanding of the subject. Then a panel discussion follows, with all poster authors and other participants present.

Understanding poster and poster-panel sessions is important because their use by major research organizations is increasingly popular. The following list, for example, includes only a few of the organizations that regularly use poster sessions; we've included it to illustrate the growing acceptance of this format.

American Association for the Advancement of Science
American Association of Immunologists
American Association of Pathologists

American Association of Physics Teachers
American Astronomical Society
American Chemical Society
American Institute of Biological Science
American Institute of Nutrition
American Medical Association
American Physical Society
American Physiological Society
American Society of Biological Chemists
Federation of American Societies for Experimental Biology
General Motors Corporation
International Business Machines, Inc.
Society for Industrial and Applied Mathematics

POSTERS IN UNDERGRADUATE EDUCATION

In colleges and universities, the use of poster presentations can be a valuable tool for students, helping them communicate their research effectively to highly diverse audiences. Although poster sessions may not have been adapted throughout, the importance of general communication skills is recognized in many publications. (1,3,4,5, 7,8,10,11)

Poster sessions combine the skills of technical writing, illustrating, and speaking. The poster presentation is a demanding form; space-limited, it must be concise yet thoroughly present the subject in a self-explanatory and logical fashion. It requires not only a well-honed writing style, but a strong sense of visual composition. As Sleeman, et al., note, "In order to strongly attract attention, displays and exhibits require design. Once attracted, the attention needs to focus on the element of emphasis."(8)

Although not referring to poster sessions, Beck and Wallisch (1), have pointed out the need for improving instruction to develop strong visual-aids skills:

> In some technical writing courses, instruction in the design and preparation of visual aids receives only indirect attention. Frequently the topic is subsumed entirely into other types of instruction or is taught only theoretically, almost as an afterthought.

Posters provide a focus for the integration of written and visual reporting. McCarron (7) has further emphasized the need for oral briefing practice in the classroom, saying:

> Reporting orally in the classroom helps students prepare for the numerous informal and formal oral briefings they will deliver in professional life. Class work stresses differences between oral and written technical communication, practice with graphics, adjustment to feedback, and the importance of ethos.

The poster is an alternative to the formal briefing or lecture, but it more closely approximates the informal briefings or informative talks required of a professional conducting a tour of a laboratory facility, etc. Poster presentations are not unplanned speaking because the student must be able to explain the entire poster logically for those who inevitably ask, "Explain what you did." The student must also be able to excerpt data for such questions as, "What were your key conclusions?" And the student must be able both to answer general questions and to extend the technical discussion beyond the bounds of the presentation

itself. The variety of questions that may be asked and the variety of the audience's background both require careful preparation and thought by the student.

After developing the poster presentation, a student may have to supplement the session by providing a handout or a demonstration (such as computer equipment or an engineering project). These expansions of the poster presentation provide further practice for the student in communicative techniques.

Poster presentations offer the instructor a unique opportunity to get his students out of the classroom and into the public's view. For example, sessions could be scheduled for open-house displays or when other visitors are in the department. During these occasions, quality poster presentations inform visitors of department activities and present a favorable image of the students working in a department while, at the same time, giving the students the experience of handling varied audiences.

CURRENT USE OF POSTERS AT USAFA.

Since Fall Semester 1982, cadets in the Biology Department have been using poster sessions to communicate the results of some Independent Study (Bio 499) projects and reports on the Cadet Summer Research Program (CSRP). We believe this method has allowed more people to become fami-

liar with cadet research in biology than would be possible through formal briefings. The suggested format of these specialized posters is shown in Figure 2.

Following the format specifications in Appendix 2, DFSEA (the Academy's audio-visual support department) has constructed six supports and five poster boards. Cork covering on both sides allows a presentation of ten posters in a wide hallway or a large room. These boards and supports are maintained by DFSSF (the Academy's academic support department). Also, three more poster boards and four supports are maintained by the Department of Biology.

Figure 2: Poster Presentation Format for Cadet Summer Research and Independent Study reports

TITLE HEADER (across the top of the poster board)
- Title
- Author
- Location and sponsor of project
- Inclusive dates of project

ABSTRACT (half page summary to the left of the Title Header)

INTRODUCTION (one page)

METHODS (one to three pages)
- Include materials and equipment

RESULTS (one to six pages)
- Including tables, figures, graphs, and photographs as required

CONCLUSIONS (one or two pages)

REFERENCES (one page)

CRITIQUE (optional)
- Highlights and what you got out of the total experience, including indirect benefits

CONCLUSIONS AND RECOMMENDATIONS

As a complement to a small society meeting, the poster presentation can make the best use of limited time to communicate results of research. Also, intra- and inter-department programs can be an efficient way of publicizing the results of faculty research and enhancing intra-faculty communications. Cadet Independent Study (499s) and the results of the CSRP from most departments are adaptable to poster presentations. Consequently, poster sessions depicting results from these cadet programs might stimulate cadet interest in attaining the level of achievement necessary to qualify for these opportunities.

Greater use of poster sessions at USAFA would help the instructors of existing courses teach communicative skills while providing another means of updating the knowledge of both faculty and cadets. And exposure to the poster format could assist those who represent the Air Force at professional meetings where poster sessions are used.

Appendix 1: Instructions for Poster Authors

1. Use a format similar to the samples in Appendixes 2-4. The format should follow the general plan of a journal publication in the discipline. For example, a scientific article usually starts with an abstract, then goes on to include an introduction, statement of methods and materials, the results, a discussion, and a conclusion. A poster board reporting scientific research should be organized similarly. Standardization of format will allow spectators to review your work more efficiently, saving them time and effort.

2. Make sure the poster board surface area shown in Appendix 2 conforms to the standard used by most organizations (3'8" high and 5'6" wide). Prepare a label for the top of your poster space which indicates its title, author(s), and affiliation (department, squadron, activity, etc.). Make the lettering for this section the largest on the board, probably not less than 1" high.

3. Post a copy of your one-half page abstract in the upper left-hand corner of the poster board as shown in Appendixes 2-4. Use large print (such as "Orator") throughout your poster for clarity since the viewers may be five feet or more from the presentation.

4. Use a colored background (matting) for any or all portions of the presentation to add effective emphasis.

5. Avoid tables or figures which require more than a few minutes to comprehend. However, you should have the rest of your data readily available and even copied for those who are very interested in the subject.

6. Use photographs and drawings as much as possible; they often can more effectively convey information than detailed explanations.

7. Keep the text and figure legends short, but do not omit them.

8. Let the poster stand by itself as a presentation of results. No other information (or oral explanation) should be necessary for a clear understanding of what you are trying to convey. Consequently, design your specific format with continuity and simplicity in mind.

9. Limit the quantity of information presented. Overloading a poster presentation can seriously impair its communicative advantage over a lecture.

10. Lay out a rough draft of your poster prior to final preparation. Check for clarity, ease of following the format, and simple, effective communication. Ask an associate

(or two) for comments before you are committed to a final copy.

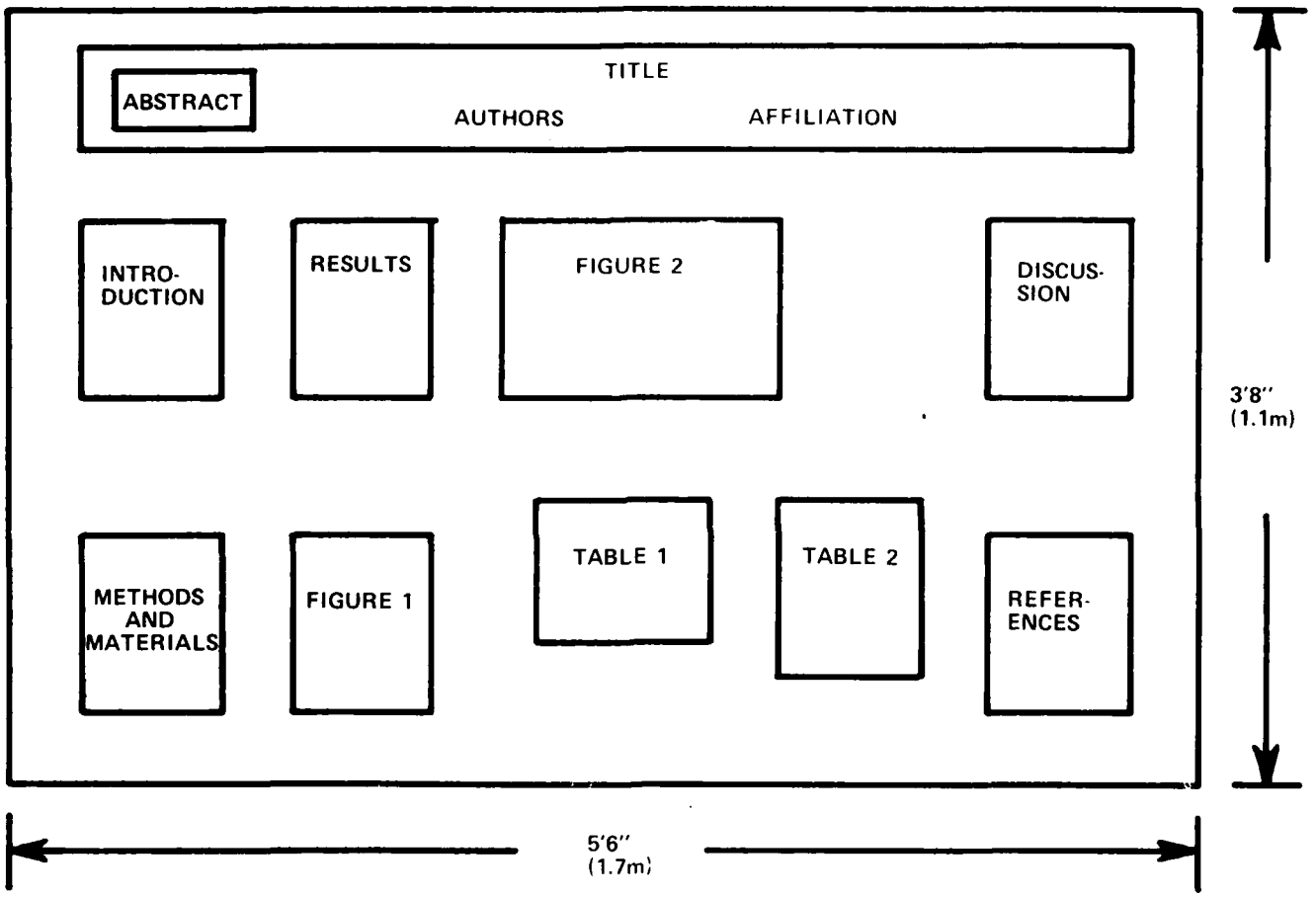
11. Have a tablet and pens available or attached to the poster board so you can further describe some aspect of your work. Additionally, your viewers can use the pad to communicate information to you during your absence or to provide you with names, addresses, and ideas about related projects you might be interested in.

12. Identify yourself as the author even if you already have a name tag. The identification you wear should also show where you are from. This allows your viewers to identify you easily when they want to ask someone for explanations.

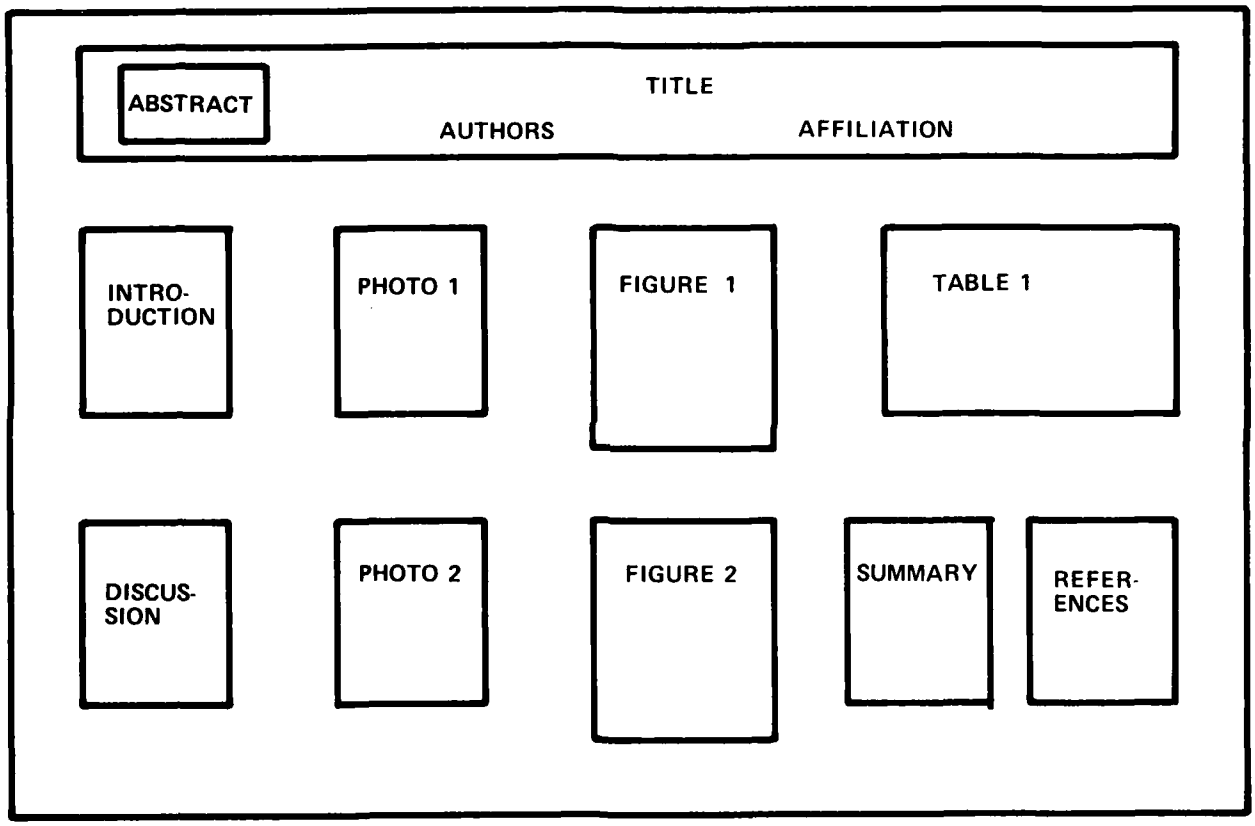
13. Always try to find out about the viewer's background and level of knowledge before formulating your response.

14. Do not let one viewer dominate your time while others are waiting. Instead, you might suggest a talk at a later time and place.

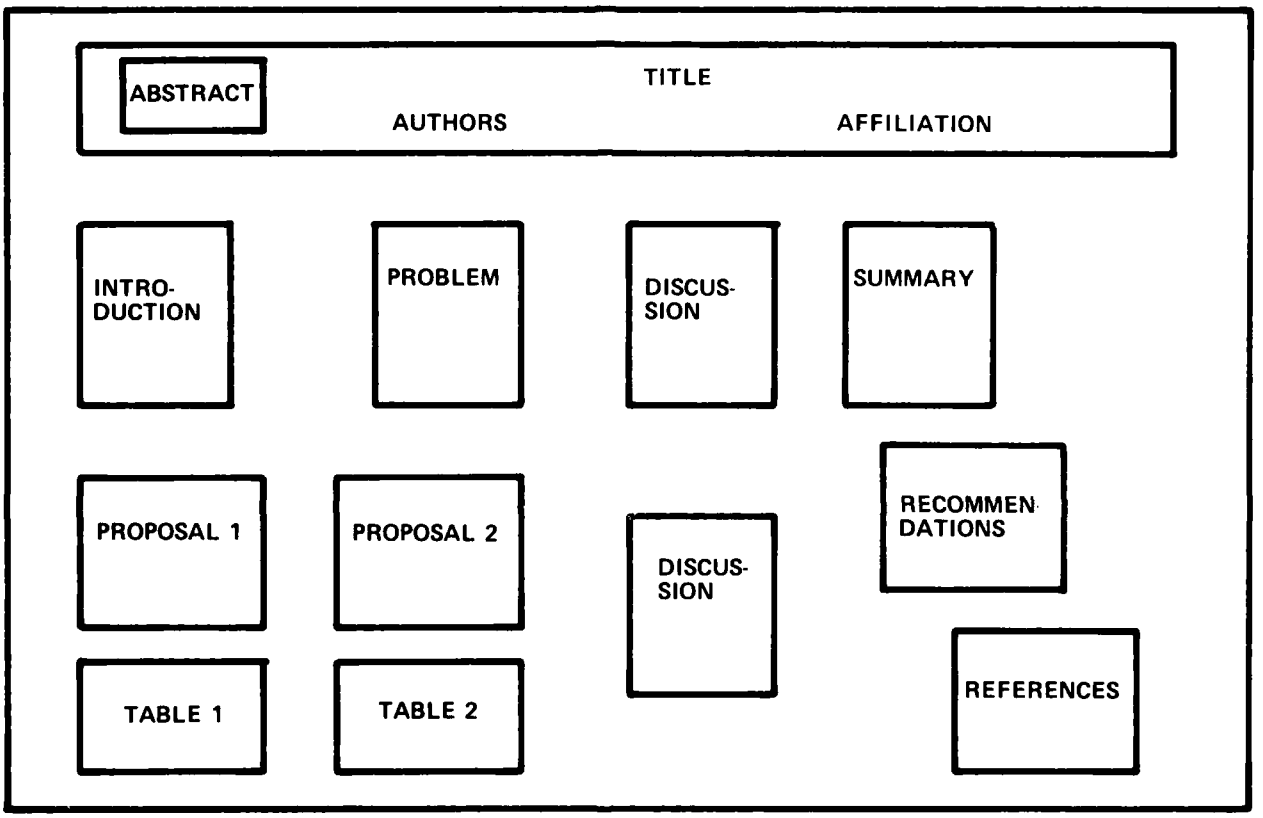
Appendix 2: Poster Format for Scientific Meetings



Appendix 3: Alternative Poster Format for Scientific and General Use



Appendix 4: Poster Format for Non-Technical Disciplines



Appendix 5: Planning a Poster Session

1. Request abstracts early enough to ensure their inclusion in a program schedule which lists titles, abstracts, location of posters, and times when the authors will be available at their posters. Spectators can also use this handout to record more information about those presentations or authors of particular interest.

2. If you sponsor a large number of posters, group the posters by topic, and organize the handout similarly. Also, to avoid confusion, you may have to number the individual posters and entries in the handout.

3. Reserve (well in advance) the use of poster boards and supports from DFSSF (and possibly DFB).

4. Arrange for name tags to identify authors and their affiliations (department, institution, etc.)

5. Allow some time prior to general viewing for the authors to visit each other's presentations. This visit can save embarrassment because all authors will know ahead of time if other posters contain contradictory information.

6. With fewer than twenty presentations, limit to an hour or two the time authors must be present.

7. Ask the participants if they require additional support (such as projectors), and reserve these items well in advance.

8. Provide push pins for attaching the poster presentation.

9. Consider sending the participants a copy of Appendixes 1-4 of this report.

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